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I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003905973 for a patent by A.H.C. CARLISLE ATF PRECISIONWALL DISCRETIONARY TRUST as filed on 30 October 2003.

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WITNESS my hand this
Fifteenth day of November 2004

LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
AND SALES

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION
STANDARD PATENT

Integrated Concrete and Plastic Modular Walls

The following statement is a full description of this invention,including the best method of performing known to me.

Integrated Concrete and Plastic Modular Walls

(described as PrecisionWall in the text)

This invention relates to an improved method of constructing load bearing walls for houses and light industrial and commercial buildings.

Cottage housing requires a load bearing wall system to be constructed at an early stage of the construction process to enable upper floors, doors, windows and a roof system to be fitted or built. Stud walls of timber or steel are not acceptable to many buyers of new housing.
Brick walls are acceptable but suffer from periodic shortages of tradesmen and bricks. Brick walls require plastering and the finished walls are subject to many disputes because of cracks and other defects.
Concrete walls made by the tilt system are not as adaptable as brickwork because detailed formwork is needed for housing. Precast concrete panels are expensive and relatively inflexible as to variations in design.

The PrecisionWall system of concrete filled interlocking formwork tubes overcomes the above problems as follows:-

Labour – a skilled supervisor with unskilled labour can erect the plastic tubular formwork thereby taking bricklayers out of the system except where non-loadbearing external walls are needed. Additionally plasterering is replaced by plaster sheeting to produce a superior wall surface.

Compatibility - PrecisionWall will mainly be dimensioned to be compatible with frequently used dimensions in the building industry so that as an example standard doors and windows can be used.

Flexibility - PrecisionWall provides a flexible system which can economically provide the variable shapes and dimensional accuracy required by the housing industry.

Additionally PrecisionWall will provide very accurate wall surfaces and openings thereby making it easier for succeeding trades to complete their work to a high standard.
PrecisionWall can be varied dimensionally and differing plastics can be used. However the main completed product dimensions will match industry standards and the formwork will usually be made of PVC.

Buildings which use PrecisionWall can be constructed more quickly and to a higher standard than similar buildings using bricks or precast panels.

To assist with understanding the invention, reference will now be made to the accompanying drawings which show one example of the invention.

FIGURE 1

(7) shows a side elevation of a Precision Wall tube. The tubes can be cut to length as required.

(8) shows the surface to which plasterboard or other sheeting can be fixed or glued.

FIGURE 2

The basic extruded plastic tube in Plan View is shown as (1). The tubes have thin walls and are light weight thereby lowering transport costs and are easily handled on site.

(2) and (4) are the tube end walls and these have slots or circular holes (14).

The webs shown as (3) resist hydrostatic pressure bulging the flat surfaces.

A type (4) end fits against the type (2) end of the adjacent tube thereby allowing the concrete to flow from tube to tube to create a homogeneous and waterproof mass as well as quickening the concrete loading process.

The concrete can be varied in specification according to whether strength or insulating qualities are required.

(6) shows the flanged end which overlaps on the flange recess (5) to form a joint which can be mechanically fixed or glued to provide a waterproof joint.

FIGURE 3

(2) is the tube end wall.

(9) is the PGI steel channel which is fixed (10) to the footing of the ground slab(15). Alternatively the channel can be fixed to the floor surface (11).

The tubes are fitted into the channel and held in place by temporary bracing.

(12) shows the inside face of the outer skin which is non-load bearing and may be brick, limestone, precast concrete, fibre cement sheeting, weatherboards or steel cladding (the last three fitted to timber or steel studwork). Furring channels can be fixed vertically to PrecisionWall and used to secure the outer wall.

(13) shows plasterboard fixed to the inside face.

(14) are the holes in the webs and the end walls which allow the concrete to flow between the tubes and form a continuous mass.

FIGURE 4

The interior wall locations are marked on the ground slab (15) and PGI channel (9) is fixed (10) accordingly.

The standard tubes are fitted to the channel and temporarily braced. Concrete is poured into the tubes thereby completing the inner and outer load bearing walls except for the plasterboard sheeting.

The load bearing walls are now ready for the succeeding trades to erect the upper floor slab (if required), roof, fit ceilings, doors, windows, wall plumbing, electrical wiring and construct the outer wall layer.

(14) are the holes in the webs and the end walls which allow the concrete to flow between the tubes and form a continuous mass.

(8) are the surfaces for fixing sheeting.

FIGURE 5

The plan view shows a series of tubes fitted together with plasterboard sheeting (13) to form an internal wall.

During assembly the flange (6) and the flange recess (5) can be screwed and/or glued to provide greater strength and a waterproof joint.

Reinforcing rods (17) can be inserted to strengthen the structure if required. The rods rest in the web and wall holes (14).

Concrete is poured into the top of the tubes shown as (16) and flows through the webs and into the adjoining tubes and this process is repeated until all tubes are full.

Plasterboard or sheeting is fixed to the walls (13) and the voids (19) thereby created can be used for locating plumbing and electrical services.

FIGURE 6

Window openings (20) are constructed by erecting lintel support tubes (21) to take lintel tubes (22). A lintel support tube is a standard PrecisionWall tube cut to length.

The space between the lintel support tubes is filled with short length standard tubes (23) and if necessary a telescopic tube (24).

The doorway (25) can have varying heights by adding more lintel tubes (22).

The concrete is poured to a maximum height of 1 metre and allowed to set before the next pour is commenced thereby preventing the short length tubes from overflowing.

Lintel support tubes have sealed end surfaces where they are exposed to window and door openings.

(9) is the PGI steel channel which is fixed to the ground slab(15).

(7) shows a side elevation of a standard Precision Wall tube.

	FIGURE 7
5	This is the end elevation of two lintel beams (26) in lintel tubes (22) with the assembly sitting on a lintel support tube (21). The lintel tubes are also used as corner tubes and shown as (28) in Figure 10. The holes in the tubes are shown as (14).
	FIGURE 8
10	The lintel beams (26) are fitted to the lintel tubes (22) and the assembly is place on the lintel support tubes (21). The butt join (27) is sealed prior to the concrete pour by using an epoxy resin filler. The concrete is poured into the top holes (14)
15	The window opening (20) allows the window assembly to be fitted at a later time. (7) shows a side elevation of a standard Precision Wall tube.
	FIGURE 9
20	To allow for irregular length walls or openings a telescopic tube assembly will be supplied (24). This is a plan view of a telescopic tube (24) created by cutting a corner tube (28) and inserting an inner tube (30) which is cut to length. The type (30) tube can be multi-celled according to the length required. (32) shows the
25	minimum length and (33) shows the maximum length. The laps created by the inner tube walls (30) and end sections (31) overlapping (29) are then glued or mechanically fixed.

FIGURE (10)

A corner tube (28) is glued or screwed to standard tubes(1) or a telescopic tube (not shown) and temporarily braced until the concrete is poured.

The concrete flows between the tubes thereby locking the corner. Steel reinforcing can be used to strengthen the corners.

"T" formations can be created by attaching a standard PrecissionWall tube to one of the blank faces of the corner tube.

FIGURE 11

(38) shows a triangulated bracing system that is temporarily fixed to the floor slab (15) and incorporates a work platform.

The bracing has screwed sections to allow verticality to be easily achieved.

The bracing is erected and the inner longitudinal plates (40) and (41) are fixed to the bracing.

The standard PrecissionWall tubes (7) are erected and the outer longitudinal plates(39) and (42) are through bolted to the inner plates.

The upper plates protect the tubes during the concrete pour.

The bracing stays in place until the concrete has sufficient strength or the upper floor slab has been poured or until the roof has been fixed in place.

Alternatively standard formwork can be used.

CLAIMS

The claims defining the invention are:-

1) Rigid plastic extruded tubes have an inter locking system which uses dimensions which conform with current housing material dimensions.

2) The plastic formwork tubes have perforated side walls which allow the concrete core to form a continuous mass thereby enhancing strength and preventing movement which leads to wall cracks and failure. Reinforcing steel can easily be added to provide higher strength levels.

3) The plastic tubes and concrete provide a waterproof layer which prevents dampness from entering the interior house space.

4) The plastic and concrete walls are load bearing and can be aesthetically finished by using plaster board on the inside and conventional non-load bearing walls on the outside.

5) The plastic and concrete walls will allow very accurately dimensioned walls to be constructed thereby allowing succeeding trades to achieve higher standards of finish at lower costs.

6) Temporary bracing is used to provide rigidity and accurate verticality before the concrete sets.

7) The tubes and the assembly systems are shown in attached Figures 1 to 11.

A.H.C. Carlisle as Trustee for the
Precision Wall Discretionary Trust
as the Applicant.

29th October 2003.

ABSTRACT

A modular plastic formwork system for integrated plastic and concrete walls is disclosed.

The plastic formwork is light and allows rapid and accurate load bearing walls to be constructed.

The formwork can use the same modular dimensions which are standard in the building industry thereby allowing items such as standard windows and doors to be used.

The formwork connects by a flange system with perforated interfaces thereby creating an integrated mass of concrete and plastic.

The plastic outer layer is waterproof and the concrete is waterproof.

Aerated concrete can be used to create higher levels of insulation.

Bricklaying and plastering are taken off the critical path thereby allowing buildings to be quickly constructed when there are brick and labour shortages and constructed to higher levels of finish and strength at all times.

The finished building appears to be conventional but has a stronger, more accurately dimensioned waterproof and possibly better insulated inner wall core.

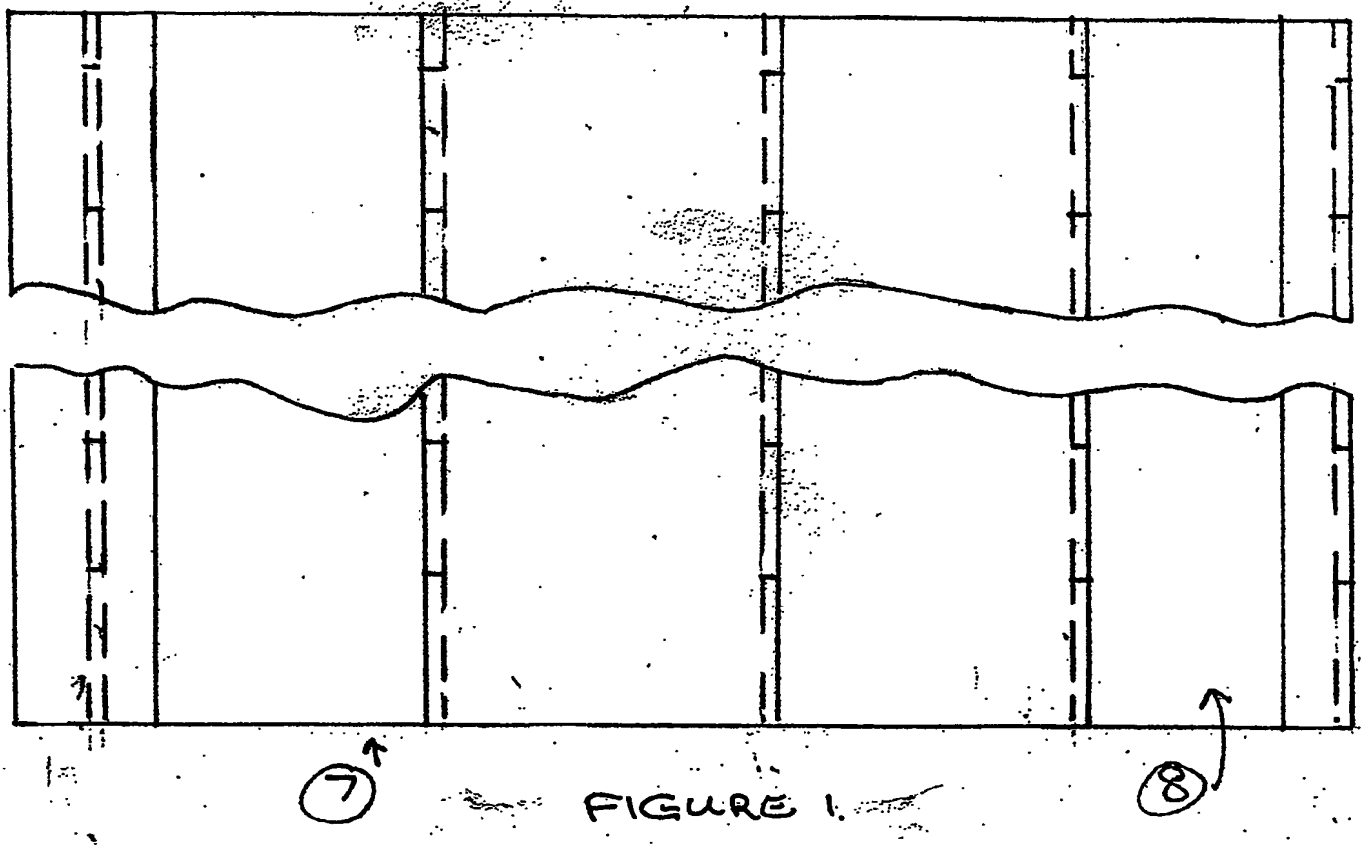


FIGURE 1.

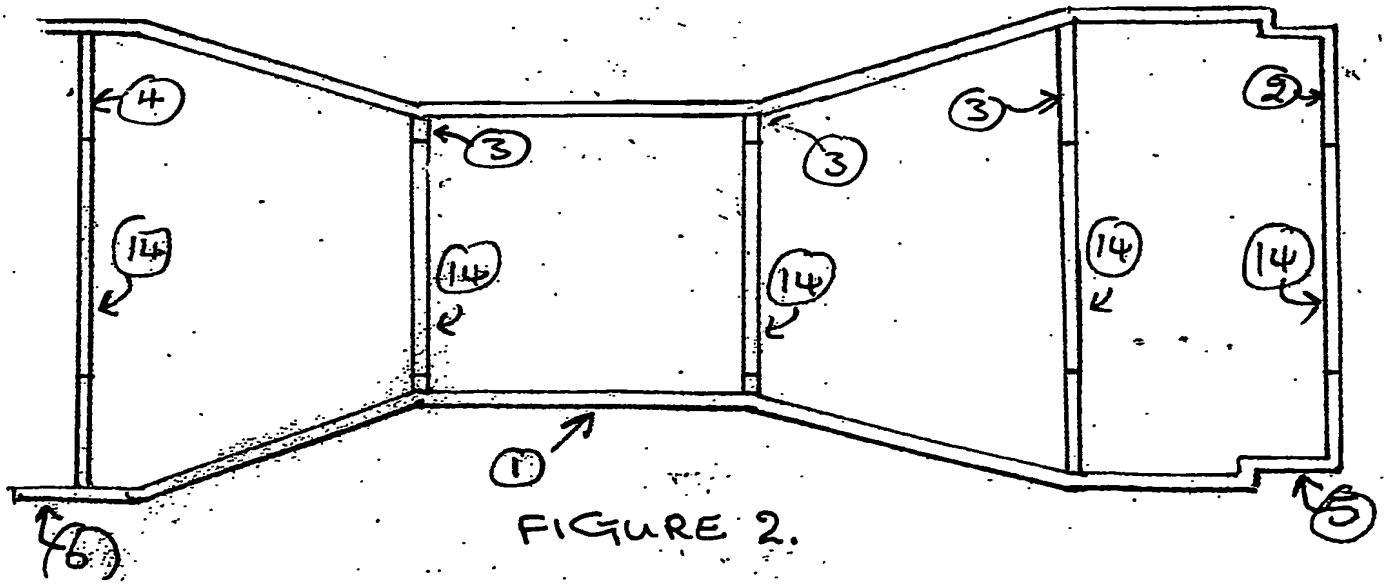


FIGURE 2.

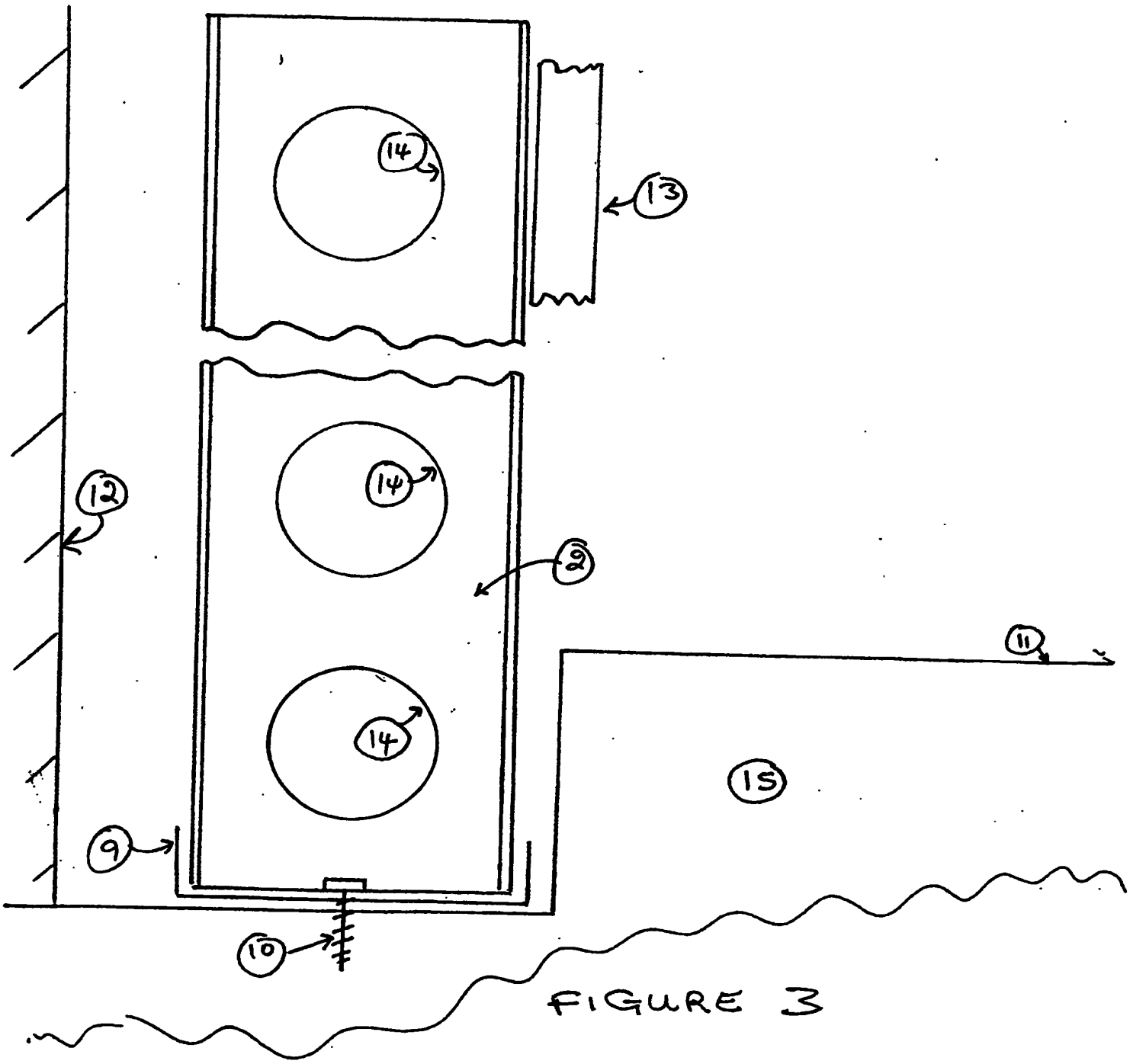
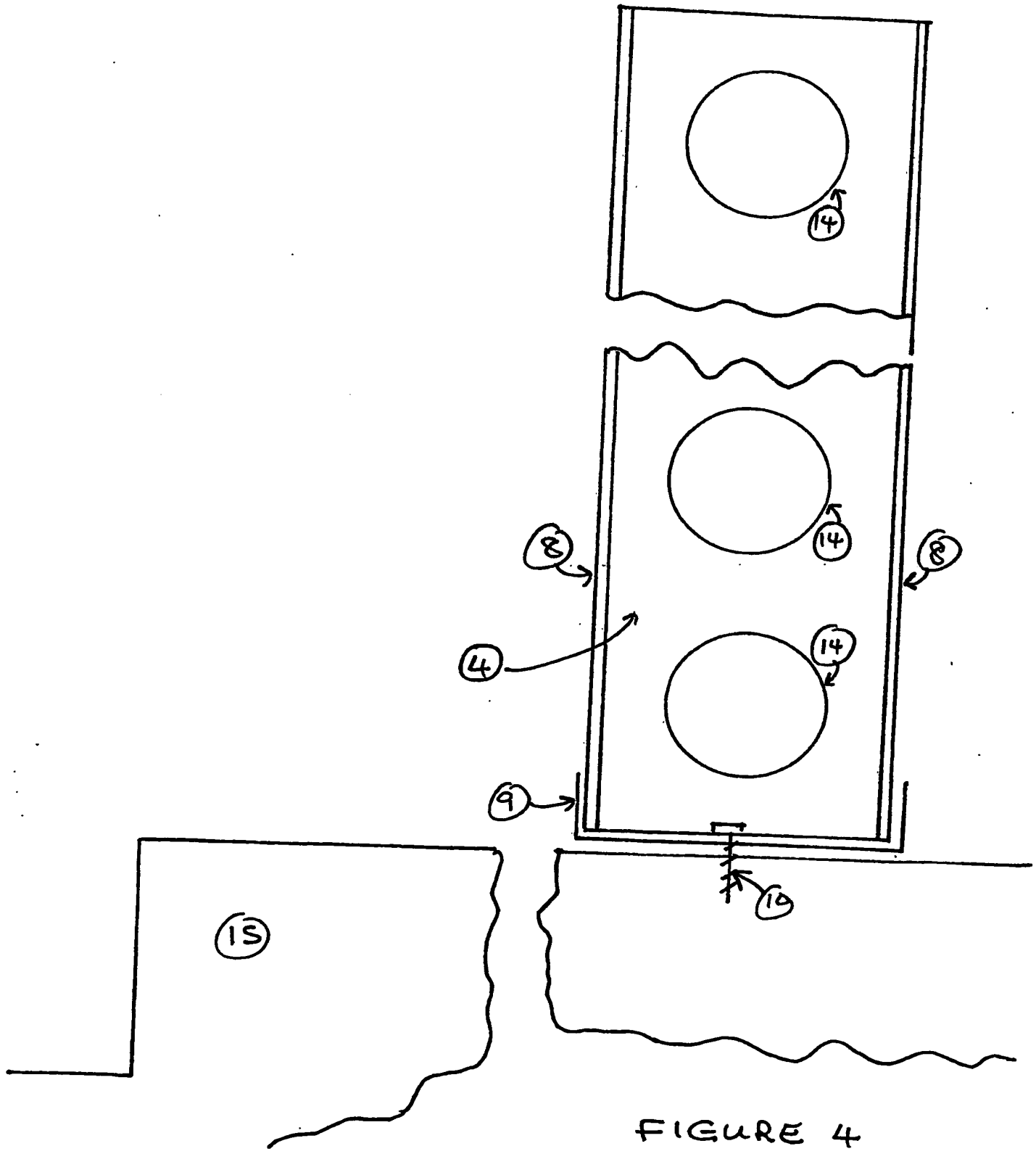


FIGURE 3



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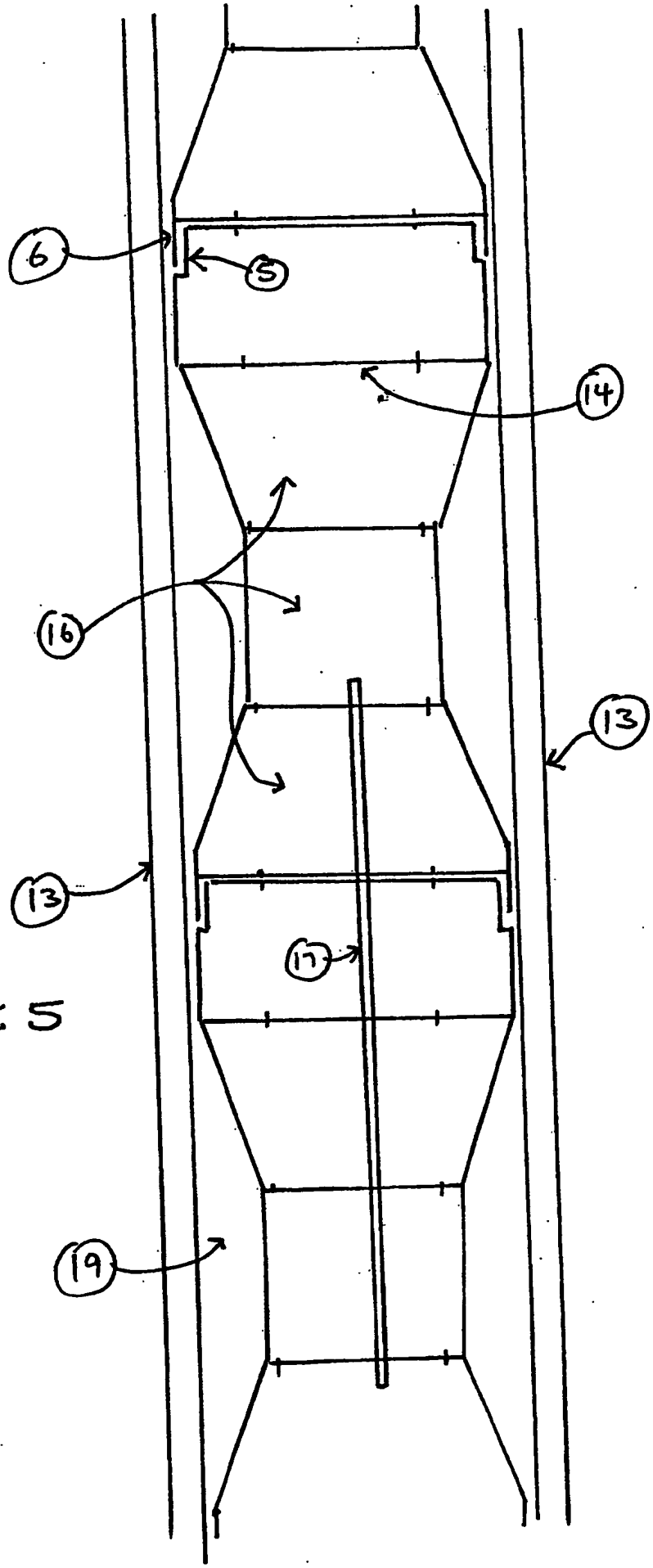


FIGURE 5

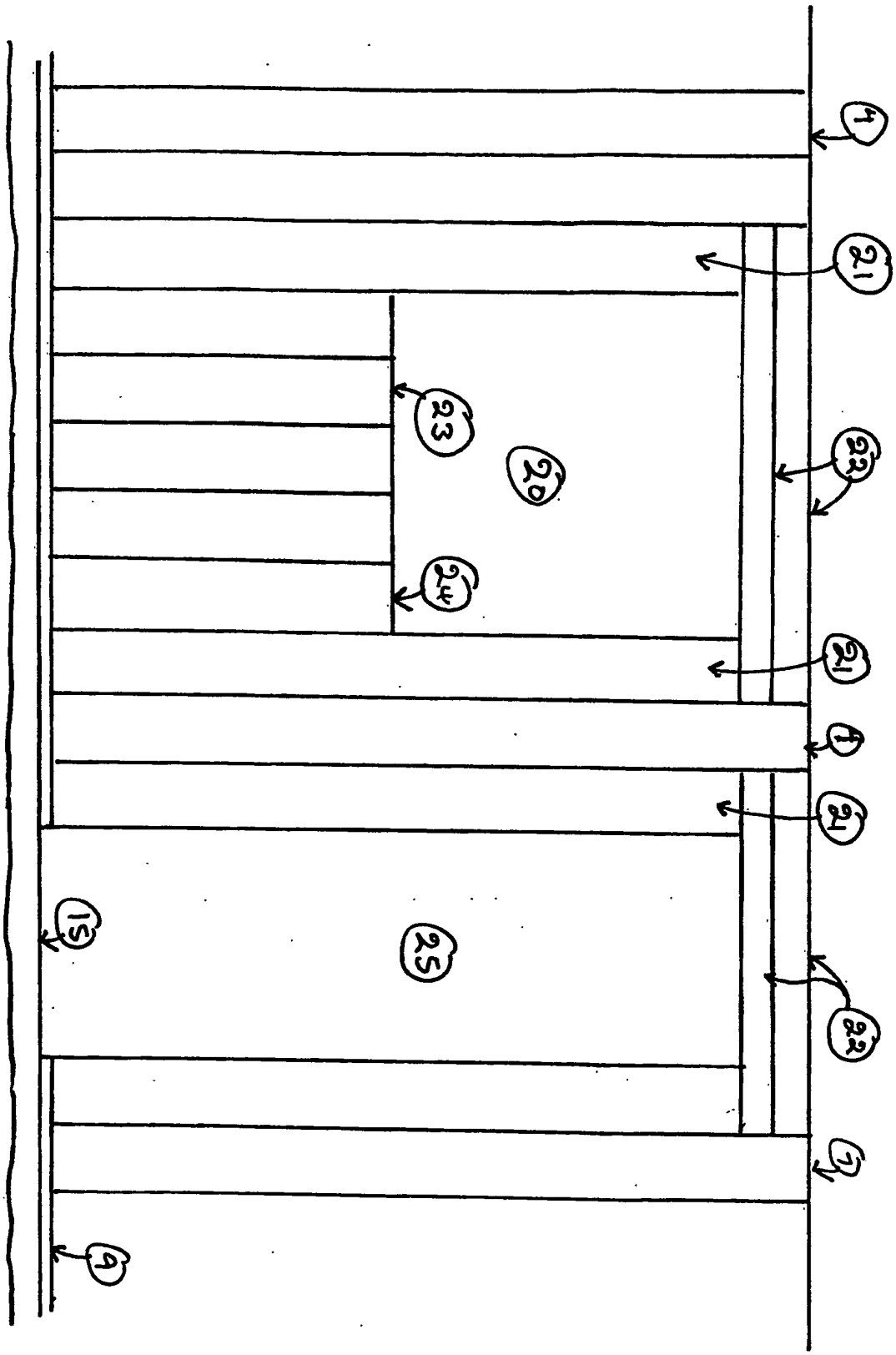


FIGURE 6

FIGURE 7

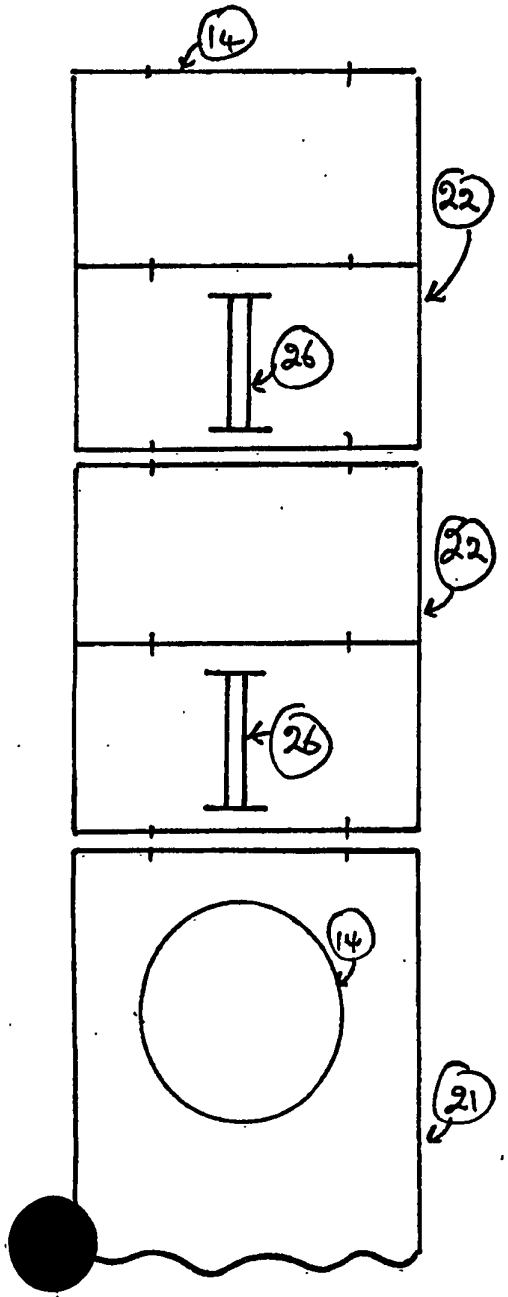


FIGURE 8

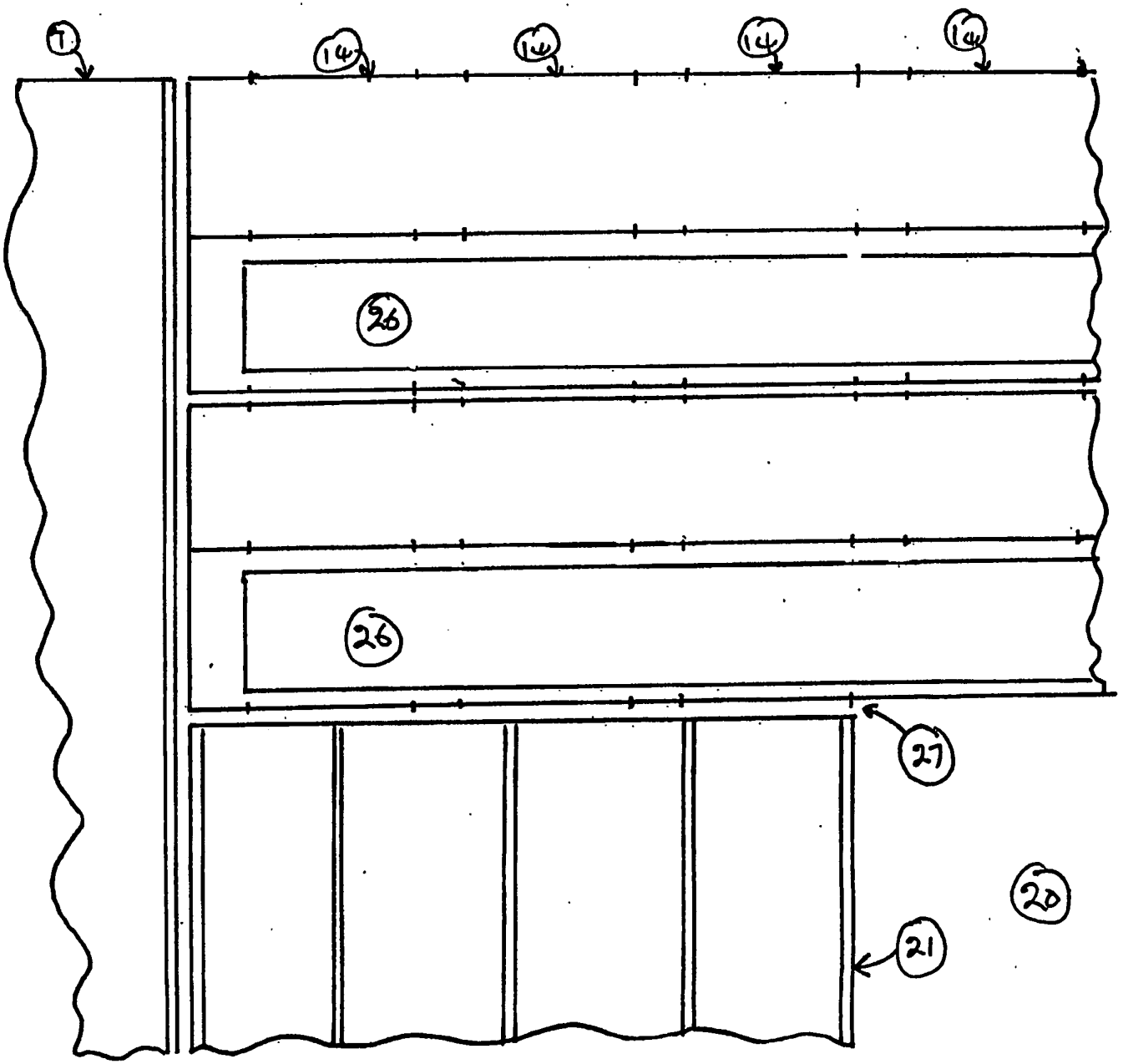
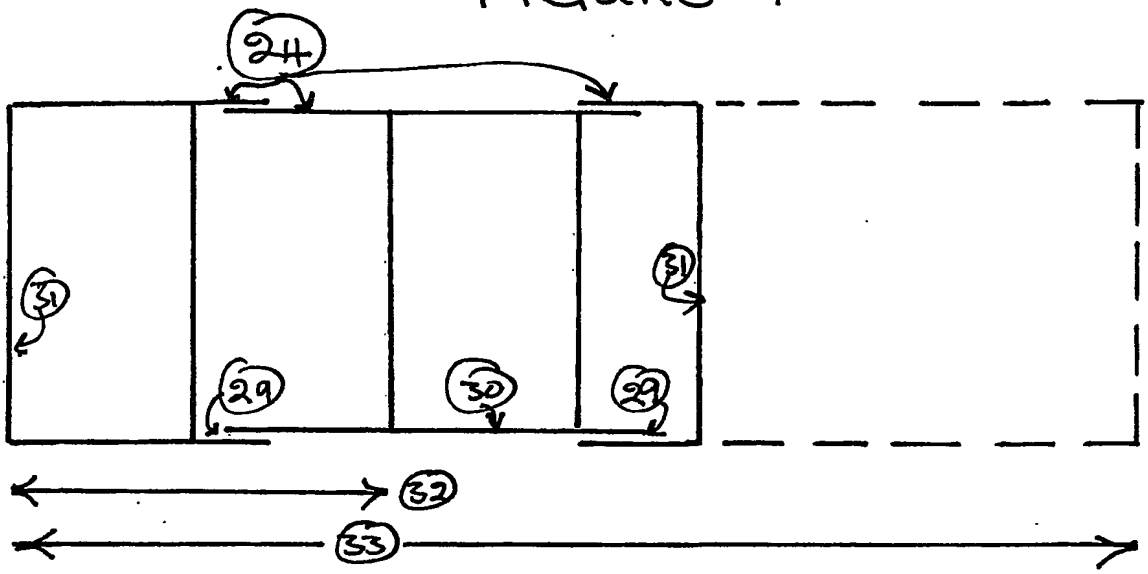


FIGURE 9



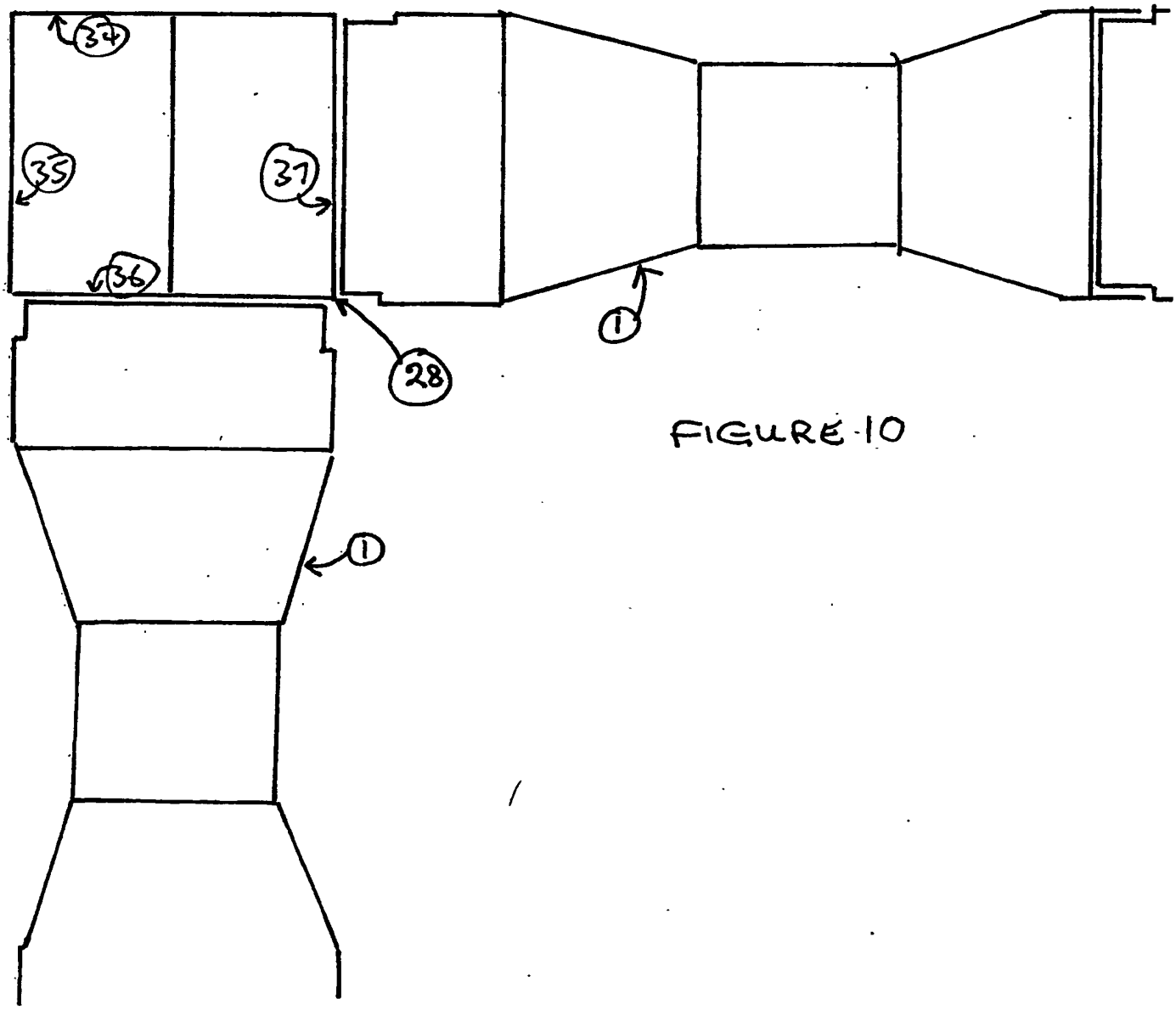


FIGURE 10

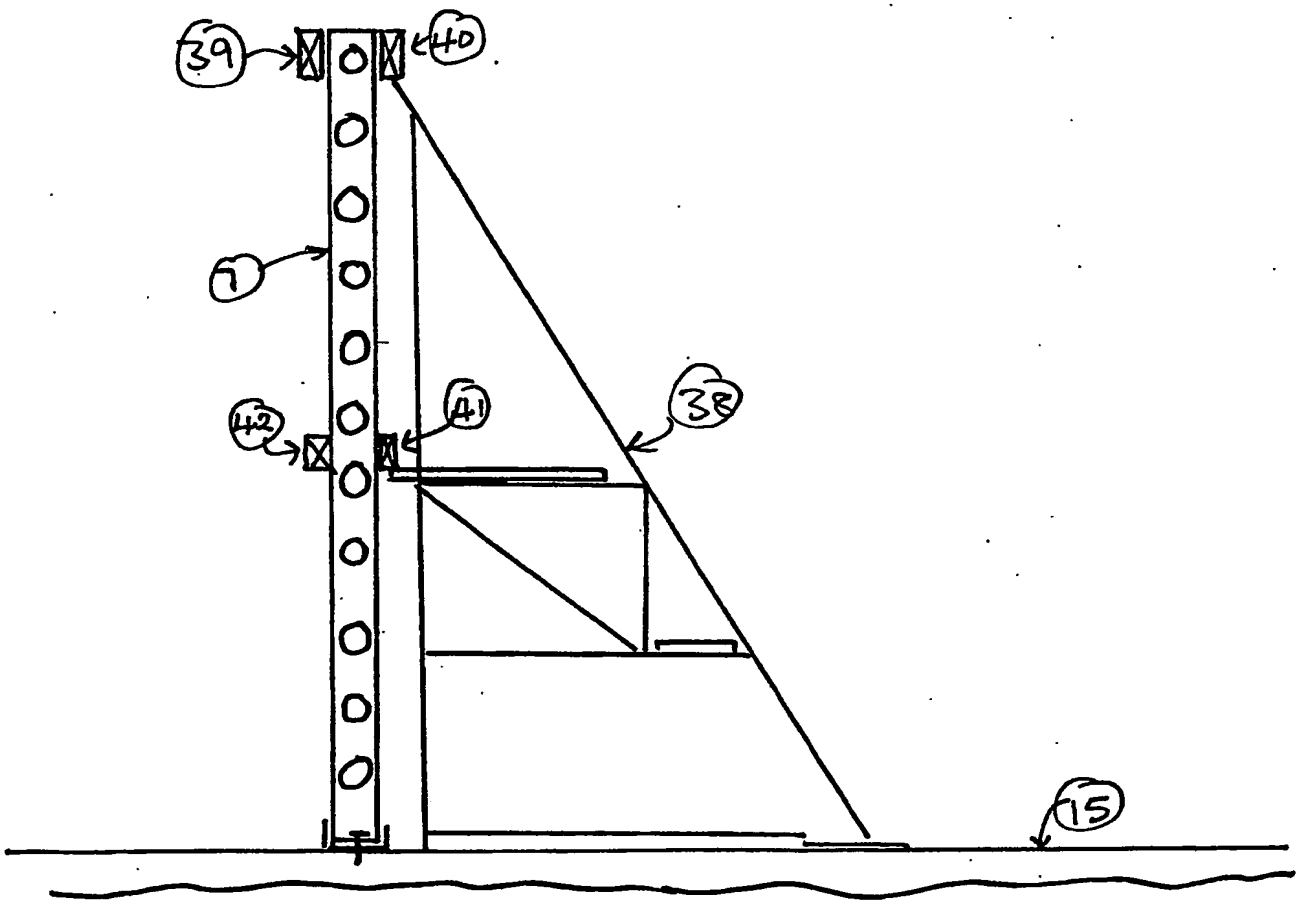


FIGURE 11

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